

September 4, 2007

The Honorable Mark Sanford  
Governor of South Carolina  
Office of the Governor  
P.O. Box 12267  
Columbia, S.C. 29211

Dear Governor Sanford,

Clemson University Public Service Activities remains committed to enhancing the competitiveness of South Carolina's agribusiness cluster, the most critical component of the state's rural economy.

The support from the General Assembly in FY 2007-2008 contributes directly to our ability to deliver the research, extension and regulatory programs that are vital for the success of one of the state's leading industries. Our goal for this budget plan is to continue to build on our core mission of service to the agribusiness cluster and the citizens of South Carolina.

The FY 2008-2009 Budget Plans for Clemson University Public Activities are summarized below. These priorities are part of a five-year plan to invest in public service programs that will directly impact economic development in South Carolina. We are hopeful the state can build on the increases that were recommended in FY 2007-2008 and continue support for Clemson Public Service Activities. Increased base funding to enhance the economic competitiveness of the state's agribusiness cluster remains our highest priority.

### **Budget Plan**

Several critical programmatic needs are identified for which we seek specific base funding. These initiatives are:

- \$2.5 million for agribusiness cluster research and Extension support
- \$2.0 million for a biofuels initiative
- \$2.0 million for an animal health and biomedical initiative
- \$1.2 million for environmental sensing research

These initiatives are focused on Clemson Public Service Activities' goal areas and are directly related to the state's efforts to build a knowledge-based economy.

Capital funding requests included in the budget plan are:

- \$13 million to construct a farm animal research center to replace 30 year old facilities
- \$12 million to construct a bio-ethanol pilot processing plant
- \$32 million to construct a pilot-scale bioprocessing facility
- \$5 million to construct a biosafety level III laboratory to enhance disease control measures, veterinary diagnostics and research at the Livestock Poultry Health facility

- \$7million to construct a plant transformation center at the Pee Dee Research and Education Center

The funding of these capital projects is a high priority and critical to our mission to enhance the agribusiness cluster in South Carolina.

#### **Addendum 2008-2009**

For FY 2007-2008, the General Assembly worked to fund increases to Clemson Public Services Activities with an allocation of both recurring and non-recurring funds. However, even with these increases, recurring state allocations are 6% below the funding level of June 30, 2001.

Budget cuts since July 1, 2001 dramatically reduced Clemson University Public Service Activities' budget. 212 positions were lost, leaving us seriously understaffed in some of our core agricultural areas. We have begun efforts to make some areas self-sustaining using market based pricing to remove these programs from state funding and allow these funds to be reallocated to other internal priorities. In the past three years, the S.C. General Assembly has allocated additional funding specifically to rebuild expertise in strategic areas that are critical to the state's economic development, such as agriculture, biotechnology, forestry and natural resources. This is an excellent base to build upon, but there are still many unfilled positions that are vital to help the agribusiness cluster prepare for the future, attract new industries and research partners, and build the knowledge-based economy of South Carolina.

It is a difficult, if not impossible, task to identify the lowest priority activities of Clemson University since each is important in meeting the needs of our agribusiness clients. The elimination of 10% of these activities would severely impact our ability to deliver on the services they need and expect. Each activity relates to an important component of our institution and is critical to fulfilling the mission of Clemson Public Service Activities.

#### **Provisos**

Clemson University is not requesting any changes to provisos.

I realize that you face difficult decisions to prioritize the budgetary needs of the State. I am hopeful that the value we provide to the agribusiness cluster of South Carolina will be seen as a high priority. We look forward to working with you and the legislature to build the State's knowledge-based economy and improve the quality of life for citizens of South Carolina.

Sincerely,

James F. Barker FAIA  
President

## FISCAL YEAR 2008-09 BUDGET PLAN

### I. EXECUTIVE SUMMARY

A. Agency Section/Code/Name: SECTION 35, P20-Clemson University Public Service Activities

B. Statewide Mission: The Mission Statement of Clemson University Public Service Activities: To improve the quality of life for South Carolinians through research education and quality assurance programs for food fiber and natural resources.

C. Summary Description of Strategic or Long-Term Goals: The Public Services Activities at Clemson University focus resources toward five goal areas that are reflected in the university's ten year goals, in the Southern Association of Colleges and Schools (SACS) assessment procedure and in the five year plan of work, which is negotiated with the U.S. Department of Agriculture. The PSA goals are to promote:

Goal 1: Agrisystems Productivity and Profitability

Goal 2: Economic and Community Development

Goal 3: Environmental Conservation

Goal 4: Food Safety and Nutrition

Goal 5: Youth Development

All of the units within PSA have aligned their programming, funding, evaluation and accountability functions around these five goal areas.

D.

Summary of Operating Budget Priorities for FY 2008-09:		FUNDING					FTEs			
		State Non- Recurring	State Recurring	Federal	Other	Total	State	Fed.	Other	Total
Priority No.: 1	Title: Agricultural and Forestry Production: Enhancing the Agribusiness Cluster	0	2,500,000	0	0	\$ 2,500,000	29	0	0	29.00

Summary of Operating Budget Priorities for FY 2008-09:		FUNDING					FTEs			
		State Non-Recurring	State Recurring	Federal	Other	Total	State	Fed.	Other	Total
Strategic Goal No. Referenced in <u>Item C</u> <u>Above (if applicable):</u> Activity Number & Name: 1510 Sustainable Agricultural Production Systems: Animal Production Systems 1514 Sustainable Agricultural Production Systems: Agronomic Crops 1487 Natural Resources and Environmental Research and Education: Water Quality and Quantity 1488 Natural Resources and Environmental Research and Education 1498 Sustainable Forestry Management and Environmental Enhancement										
Priority No.: 2	Title: The BioFuels Economy		2,000,000	0	0	\$2,000,000	16	0	0	16
Strategic Goal No. Referenced in <u>Item C</u> <u>Above (if applicable):</u> Activity Number & Name: 1514 Sustainable Agricultural Production Systems: Agronomic Crops 1498 Sustainable Forestry Management and Environmental Enhancement 1502 Rural Community Economic Development										
Priority No.: 3	Title: Animal Health and Biomedical Development		2,000,000	0	0	\$ 2,000,000	15	0	0	15

Summary of Operating Budget Priorities for FY 2008-09:		FUNDING					FTEs			
		State Non- Recurring	State Recurring	Federal	Other	Total	State	Fed.	Other	Total
Strategic Goal No. Referenced in <u>Item C Above (if applicable)</u> : Activity Number & Name:	1493 Agricultural Biosecurity 1510 Sustainable Agricultural Production Systems: Animal Production Systems									
Priority No.: 4	Title: Remote Environmental Sensing		\$1,200,000	0	0	\$ 1,200,000	12	0	0	12
Strategic Goal No. Referenced in <u>Item C Above (if applicable)</u> : Activity Number & Name: 1488 Natural Resources Environmental Research and Education										
TOTAL OF ALL PRIORITIES			\$ 7,700,000	\$ 0	\$ 0	\$ 7,700,000	72.00	0.00	0.00	72.00

E. Agency Recurring Base Appropriation:

State \$ 50,619,437

Federal \$ 13,279,878

Other \$ 10,271,760

F. Efficiency Measures: During the 2006-2007 fiscal year, PSA aligned its extension, research, and regulatory activities into activity categories. The categories are derived from the five PSA Goal Areas. As a result of clearly identified goals, objectives, and impacts and the quantification of projected outcomes, PSA has optimized its resource allocations across its activity categories.

Section III, Category 2-Strategic Planning of the PSA 2006-2007 Accountability Report describes PSA's strategic planning processes. The results presented in Section III, Category 7-Business Results are analyzed regularly to determine the effectiveness and efficiency of PSA's research and outreach programs. Longitudinal comparisons of projected and actual results across activities assist Senior Leaders in identifying techniques to maximize resources allocations within the activity categories, as well as to develop action plans for process and programmatic improvements to meet the overall mission of the organization.

G.


<b>Summary of Capital Budget Priorities:</b>			<b>Additional State Funds</b>	<b>Previously Authorized State Funds</b>	<b>Total Other Fund Sources</b>	<b>Project Total</b>
Priority No.: 1	<u>Project Name:</u> Farm Animal Research Center Activity Number & Name: 1510 Sustainable Agriculture Production Systems: Animal Production Systems 1495 Agriculture Biotechnology 1491 Reducing the Impact of Animal Agriculture on the Environment	Project No*:	13,000,000	3,600,000	0	\$16,600,000
Priority No.: 2	<u>Project Name:</u> Activity Number & Name: Cellulosic Bio-Ethanol Pilot Plant 1495 Agricultural Biotechnology 1514 Sustainable Agricultural Production Systems: Agronomic Crops	Project No*:	12,000,000	0	0	\$ 12,000,000
Priority No.: 3	<u>Project Name:</u> Pilot Scale Bioprocessing Center Activity Number & Name: 1495 Agriculture Biotechnology	Project No*:	32,000,000	0	0	\$ 32,000,000
Priority No.: 4	<u>Project Name:</u> Expanded BioSafety Level III Diagnostic and Research Capability Activity Number & Name: 1493 Agricultural Biosecurity 1504 Livestock Poultry Health Programs: Animal Health and Diagnostic Laboratory	Project No*:	5,000,000	0	0	\$ 5,000,000

Priority No.: 5	<u>Project Name:</u> Advanced Plant Technology Laboratory <u>Activity Number &amp; Name:</u> 1496 Agricultural Biotechnology	Project No*:	7,000,000	0	0	7,000,000
Priority No.:	<u>Project Name:</u> <u>Activity Number &amp; Name:</u>	Project No*:	0	0	0	\$ 0
TOTAL OF ALL CAPITAL BUDGET PRIORITIES			\$ 69,000,000	\$ 3,600,000	\$ 0	\$ 72,600,000

\* If applicable

H. Number of Proviso Changes: 0

I. Signature/Agency Contacts/Telephone Numbers:

Agency Head Signature: 

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## II. DETAILED JUSTIFICATION FOR FY 2008-09 OPERATING BUDGET PRIORITIES

- A. Agency Section/Code/Name: SECTION 35, P20-Clemson University Public Service Activities
- B. Priority No. 1 of 4
- C. (1) Title: Agricultural and Forestry Production; Enhancing the Agribusiness Cluster  
(2) Summary Description: This initiative will build an aggressive research and technology transfer system to enhance the state's agribusiness sector that spans crop and livestock production, and natural resources conservation.  
  
(3) Strategic Goal/Action Plan (*if applicable*): Agrisystems Productivity and Profitability
- D. Budget Program Number and Name: Agricultural Research III, Cooperative Extension IV, Employee Benefits VIII
- E. Agency Activity Number and Name: 1510 Sustainable Agricultural Production Systems: Animal Production Systems  
1514 Sustainable Agricultural Production Systems: Agronomic Crops  
1487 Natural Resources and Environmental Research and Education: Water Quality and Quantity  
1488 Natural Resources and Environmental Research and Education  
1498 Sustainable Forestry Management and Environmental Enhancement
- F. Detailed Justification for Funding
- (1) Justification for Funding Increase: Agriculture and forestry represent the most critical component of the rural economy of South Carolina. The agribusiness sector creates more than 22% of all jobs, more than 17% of the income (\$15.1 billion), and more than 22% of gross sales (\$35 billion) in the state. If agribusiness is to sustain its economic value to South Carolina, it must be recognized as a vital industry cluster with emerging value-added opportunities. The following critical positions are needed to enhance the state's agribusiness cluster and protect the quality of our natural resources:
- 3 Production Agriculture Scientists to conduct research and technology transfer in traditional agriculture crops
  - 3 Precision Agriculture Scientists to conduct research and technology transfer in the areas of precision agriculture: agronomy, entomology and field crop pathology
  - 6 Natural Resources Scientists to conduct research and technology transfer in the areas of natural resources policies, sustainable environmental practices, hydrology, landscape ecology, upland forest ecology and tidal river ecology



- 10 Extension Agriculture/Natural Resources Agents to conduct technology transfer in the areas of energy conservation/alternative fuels (4 area agents) and stormwater management/forest systems management (4 area agents and 2 associates)
- 2 Forage-Fed Beef Scientists to conduct research and technology transfer in the areas of forage-fed beef genetics, management systems and forages
- 5 technical support staff are requested to provide field and laboratory support for the requested faculty research programs.

Precision agriculture scientists will support field crop producers in the development and implementation of technology for precision application of fertilizers, pesticides and other agricultural chemicals, thereby reducing costs, minimizing environmental impacts and improving production efficiencies. Natural resources scientists will develop sustainable environmental practices and strategies for water quality and natural resource protection, particularly in the fragile coastal region that is under pressure from residential and industrial encroachment. Area Extension agents will provide technology transfer in each of the state's four regions to help citizens, businesses and local governments reduce dependency on petroleum-based fuels and to help local governments develop sound environmental policies to prevent pollution from entering lakes, streams and rivers. Forage-fed beef scientists will support this growing livestock industry to produce leaner, more nutritious beef in an environmentally sound manner. This will strengthen the state's rural economy through improved agricultural production and profitability. It will also enhance the agribusiness cluster by developing and applying new technologies in precision agriculture and livestock production, and it will protect the quality of our water and forest resources.

(2)

<b>FY 2008-09 Cost Estimates:</b>	<b>State Non-Recurring Funds</b>	<b>State Recurring Funds</b>	<b>Federal</b>	<b>Other</b>	<b>Total</b>
<b>Personnel:</b>					
(a) Number of FTEs*		29			29
(b) Personal Service		1,556,868			\$ 1,556,868
(c) Employer Contributions		408,286			\$ 408,286
Program/Case Services					\$ 0
Pass-Through Funds					\$ 0
Other Operating Expenses		534,846			\$ 534,846
<b>Total</b>	\$ 0	\$ 2,500,000	\$ 0	\$ 0	\$ 2,500,000

*\* If new FTEs are needed, please complete Section G (Detailed Justification for FTEs) below.*

(3) Base Appropriation:

State	\$ 44,909,258
Federal	\$ 11,215,538
Other	\$ 7,455,793

(4) Is this priority associated with a Capital Budget Priority?       No       If yes, state Capital Budget Priority Number and Project Name: \_\_\_\_\_.

G. Detailed Justification for FTEs

(1) Justification for New FTEs

(a) Justification: In past years, Clemson has been able to use existing vacant positions to fill positions associated with new appropriated General funds. New FTEs will be needed to implement the requested initiative.

(b) Future Impact on Operating Expenses or Facility Requirements:

(2) Position Details:

	State	Federal	Earmarked	Restricted	Total
Position Title: Faculty					
(a) Number of FTEs	24				24.0
(b) Personal Service	1,364,858				\$ 1,364,858
(c) Employer Contributions	348,379				\$ 348,379

	State	Federal	Earmarked	Restricted	Total
Position Title: Technicians					
(a) Number of FTEs	5				5.00
(b) Personal Service	192,010				\$192,010
(c) Employer Contributions	59,907				\$ 59,907

(3) FTEs in Program Area per FY 2007-08 Appropriation Act:

State     \_\_\_494.88\_\_\_

Federal   \_\_\_147.37\_\_\_

Other     \_\_\_74.35\_\_\_

Agency-wide Vacant FTEs as of July 31, 2007:   306.62

% Vacant   \_\_\_7.3\_\_\_%

H. Other Comments:

A. Agency Section/Code/Name: SECTION 35, P20-Clemson University Public Service Activities

B. Priority No.   2   of   4  

C. (1) Title: Alternative Energy–The BioFuels Economy

(2) Summary Description: The development of alternative energy sources has become a primary concern and will drive the future security and economic vitality of this country. South Carolina is well positioned to play an important role by developing technology and feedstocks for the production of biofuels. The state's vast cellulosic resources (wood, grasses, crop residues) can be harvested to support a viable and sustainable biofuels industry cluster within the state. Replacing 20% of the state's current consumption of petroleum-based fuels with locally produced biofuels would result in a \$1 billion plus industry and create thousands of related jobs.

For this industry to develop, novel technology must be brought to bear, including feedstock development, conversion and distribution to consumers. Clemson University's partnership with Savannah River National Laboratory, S.C. State University, SC Bio and Queensland University of Technology brings together collaborative strengths to accelerate commercialization of new technology.

The following critical positions are needed to enhance the collaborative strengths and accelerate the development of new cellulosic bio-fuel technology:

- 3 Bio-processing Engineers to facilitate the scale-up of novel technology to commercialization in the area of fermentation and enzyme production
- 2 Microbiologists to conduct research and technology transfer in the area of fermentation development
- 4 Materials Handling Scientists to conduct research and technology transfer in the area forest management, harvesting and plant development for bio-fuel feedstock development
- 2 Entomologists to conduct research and technology transfer in the areas enzyme development and production
- 2 Molecular Biologists to conduct research in the Genomics Institute characterizing genes of importance in the conversion of cellulose to ethanol.

- 3 Research Technicians to support the above scientists.

(3) Strategic Goal/Action Plan (*if applicable*): Agrisystems Productivity and Profitability and Economic and Community Development

D. Budget Program Number and Name: Agricultural Research III, Employee Benefits VIII

E. Agency Activity Number and Name: 1514 Sustainable Agricultural Production Systems: Agronomic Crops, 1498 Sustainable Forestry Management and Environmental Enhancement, 1502 Rural Community Economic Development

F. Detailed Justification for Funding

(1) Justification for Funding Increase: Scientists will support the development of novel technology directly applicable to locally produced feedstocks and biofuels. Through rapid commercialization of new technology, South Carolina can take a lead in the emerging cellulosic biofuels industry.

The microbiologists will concentrate on developing fermentation and enzyme technology to convert the feedstocks to ethanol. Bioprocessing engineers will work closely with these scientists to scale-up the new technology to commercial levels. Forestry scientists will develop practices to sustainably harvest forest reserves for biofuels production.

These efforts will strengthen the state's rural economy by providing new markets for forestry and agriculture products, and will promote development of bio-refineries near these feedstocks to produce biofuels that can reduce the state's nearly \$8 billion energy trade deficit. It will enhance the quality of life for the state's citizens and improve the environment by offering locally produced biofuels with smaller carbon footprints to replace imported petroleum-based fuels.

(2)

<b>FY 2008-09 Cost Estimates:</b>	<b>State Non-Recurring Funds</b>	<b>State Recurring Funds</b>	<b>Federal</b>	<b>Other</b>	<b>Total</b>
<b>Personnel:</b>					
(a) Number of FTEs*		16			16.00
(b) Personal Service		1,212,000			\$ 1,212,000
(c) Employer Contributions		378,144			\$ 378,144
Program/Case Services					\$ 0

Pass-Through Funds					\$ 0
Other Operating Expenses		409,856			\$ 409,856
<b>Total</b>	\$	\$ 2,000,000	\$ 0	\$ 0	\$2,000,000
<i>* If new FTEs are needed, please complete Section G (Detailed Justification for FTEs) below.</i>					

(3) Base Appropriation:

State       \$ 22,871,192  
Federal     \$ 3,780,522  
Other       \$ 1,479,763

- (4) Is this priority associated with a Capital Budget Priority? \_ Yes\_\_\_\_\_ If yes, state Capital Budget Priority Number and Project Name: Priority 2: Cellulosic Bio-Ethanol Pilot Plan.

G. Detailed Justification for FTEs

(2) Justification for New FTEs

- (a) Justification: In past years, Clemson has been able to use existing vacant positions to fill positions associated with new appropriated General funds. New FTEs will be needed to implement the requested initiative  
(b) Future Impact on Operating Expenses or Facility Requirements:

(2) Position Details:

	State	Federal	Earmarked	Restricted	Total
Position Title: Faculty					
(a) Number of FTEs	13				13.00
(b) Personal Service	1,092,000				\$ 1,092,000
(c) Employer Contributions	340,704				\$ 340,704

	State	Federal	Earmarked	Restricted	Total
Position Title: Technicians					
(a) Number of FTEs	3				3.00
(b) Personal Service	120,000				\$ 120,000
(c) Employer Contributions	37,440				\$ 37,440

(3) FTEs in Program Area per FY 2007-08 Appropriation Act:

State	___249.41___
Federal	___38.53___
Other	___4.43___

Agency-wide Vacant FTEs as of July 31, 2007: 306.62  
% Vacant 7.3%

H. Other Comments:

A. Agency Section/Code/Name: SECTION 35, P20-Clemson University Public Service Activities

B. Priority No. 3 of 4

C. (1) Title: Animal Health and Biomedical Development

(2) Summary Description: This initiative will build an aggressive research and technology transfer program to support an animal agriculture industry that is advancing in its technological sophistication, as well as the developing biomedical industry and needs of South Carolina.

(3) Strategic Goal/Action Plan (*if applicable*): Agrisystems Productivity and Profitability

D. Budget Program Number and Name: Agricultural Research III, Employee Benefits VIII

E. Agency Activity Number and Name: 1493 Agricultural Biosecurity, 1510 Sustainable Agricultural Production Systems: Animal Production Systems

F. Detailed Justification for Funding

(1) Justification for Funding Increase: Animal agriculture is a leading sector of South Carolina agriculture and is an industry producing almost \$1 billion in cash receipts. Furthermore, the biomedicine industry is of increasing importance and

profitability. Human biomedicine is closely linked with animal health and animal biology so this initiative will benefit both animal and human health. These critical positions are needed to enhance the state's animal industry and biomedical interests:

- 5 Biomedical Scientists to conduct research and develop technologies in cellular or tissue development and related orthopedic mechanics
- 3 Infectious Disease Pathologists to conduct research and develop technologies in disease mechanisms and infectious agents
- 4 Genetics and Reproduction Scientists to conduct research and develop technologies in genetic and molecular regulation/improvement of reproduction
- 3 Metabolic Biotechnologists to conduct research and develop technologies in nutrient metabolism and regulation at the cell and molecular levels

Animal biology principles and mechanisms apply equally to humans and other animals, which results in model animal systems such as swine for cardiac valve research and sheep for orthopedic and reproductive hormone research. Biomedical scientists will work with bioengineers to develop advanced orthopedic prosthetics. Cell and tissue development scientists will answer questions about tissue rejection and adaptability to improve the use of these prosthetics. Infectious disease pathologists will develop information on immunity and resistance development to improve vaccination and detection strategies while also providing technologies for the treatment of infections and elimination of infectious agents. Genetics and reproduction scientists will conduct research to fully understand the cellular and molecular (genetic) regulation of reproduction. This is needed to improve technologies for achieving and maintaining pregnancy while preventing/detecting inherited disorders that will improve both animal production and human well-being. Metabolic biotechnologists will study the ways nutrients are used and how they regulate cell functions in humans and other animals to maximize their performance, growth and health through improved living strategies and technologies. These efforts and outcomes will strengthen the state's animal agriculture economy through improved animal production and profitability. This will also enhance other agribusinesses that support animal production. This scientific effort will also support development of the state's biomedical industry and improve the health, safety and well-being of its citizens.

(2)

<b>FY 2008-09 Cost Estimates:</b>	<b>State Non-Recurring Funds</b>	<b>State Recurring Funds</b>	<b>Federal</b>	<b>Other</b>	<b>Total</b>
<b>Personnel:</b>					
(a) Number of FTEs*		15			15.00
(b) Personal Service		1,260,000			\$ 1,260,000
(c) Employer Contributions		393,120			\$ 393,120

Program/Case Services					\$ 0
Pass-Through Funds					\$ 0
Other Operating Expenses		346,880			\$ 346,880
<b>Total</b>	\$ 0	\$ 2,000,000	\$ 0	\$ 0	\$2,000,000
<i>* If new FTEs are needed, please complete Section G (Detailed Justification for FTEs) below.</i>					

(3) Base Appropriation:

State       \$ \$ 22,871,192  
Federal     \$ 3,780,522  
Other       \$ 1,479,763

(4) Is this priority associated with a Capital Budget Priority?       No       If yes, state Capital Budget Priority Number and Project Name: \_\_\_\_\_.

G. Detailed Justification for FTEs

(3) Justification for New FTEs

(a) Justification: In past years, Clemson has been able to use existing vacant positions to fill positions associated with new appropriated General funds. New FTEs will be needed to implement the requested initiative

(b) Future Impact on Operating Expenses or Facility Requirements:

(2) Position Details:

	State	Federal	Earmarked	Restricted	Total
Position Title: Faculty					
(a) Number of FTEs	15				15.00
(b) Personal Service	1,260,000				\$ 1,260,000
(c) Employer Contributions	346,880				\$ 346,880

	State	Federal	Earmarked	Restricted	Total
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Position Title:					
(a) Number of FTEs					0.00
(b) Personal Service					\$ 0
(c) Employer Contributions					\$ 0

(3) FTEs in Program Area per FY 2007-08 Appropriation Act:

State 249.41  
Federal 38.53  
Other 4.43

Agency-wide Vacant FTEs as of July 31, 2007: 306.62

% Vacant 7.3%

H. Other Comments:

A. Agency Section/Code/Name: SECTION 35, P20-Clemson University Public Service Activities

B. Priority No. 4 of 4

C. (1) Title: Remote Environmental Sensing

(2) Summary Description: This initiative will build an aggressive remote sensing research and technology transfer capability that will enhance the state's multi-sector economy by optimizing the beneficial use of limited natural resources while minimizing environmental impacts. This capability is especially critical to decision-making associated with anticipated statewide population growth.

(3) Strategic Goal/Action Plan (*if applicable*): Environmental Conservation and Economic and Community Development

D. Budget Program Number and Name: Agricultural Research III, Cooperative Extension IV, Employee Benefits VIII

E. Agency Activity Number and Name: 1488 Natural Resources and Environmental Research and Education

F. Detailed Justification for Funding

- (1) Justification for Funding Increase: To guide public policy-making on environmental issues, real-time data is needed from watersheds, forests, coasts, and agricultural operations. This data can be gathered with minimal environmental impact by using remote sensing technologies that utilize computer sensors and immediate data processing to determine best management practices. Research is needed to link land-use, water resources, and energy production into an operations model for policy makers. Additional research is needed to establish new technologies that can acquire and utilize real-time environmental data to help ensure adequate and sustainable natural resources for the state's economy, including tourism, and to optimize use of available water resources during prolonged droughts. The following critical positions are needed to enhance the state's economy by optimizing the use, protection and quality of our natural resources, particularly water:
- 4 Ecology-based Scientists to conduct research in the areas of systems ecology, watershed ecology, hydrology, environmental microbiology, and toxicology needed to develop innovative remote sensing methodologies and technologies
  - 2 Computer Scientists to develop the neural net capabilities to collect, manage and archive large databases associated with remote sensing and data applications
  - 2 GIS Scientists/Engineers to conduct research and effective information transfer in the areas of land-use management and water resources
  - 2 GIS Technicians to support GIS capability and provide capacity
  - 2 Extension Natural Resources Agents for technology transfer in the areas of real-time data access and utilization across a multi-sector economy.

Ecology-based scientists will conduct research to identify water resource impacts from micro-pollutants, pharmaceuticals, and endocrine disruptors and develop technologies to measure these contaminants. Computer and GIS-related scientists and engineers will develop the visualization tools and data storage system necessary for evaluating large datasets needed for effective information transfer. GIS technicians will provide the capacity necessary to support the remote sensing program and produce technical documents. Extension natural resources agents will provide technology transfer and application of environmental data collection across a multi-sector user community.

(2)

<b>FY 2008-09 Cost Estimates:</b>	<b>State Non-Recurring Funds</b>	<b>State Recurring Funds</b>	<b>Federal</b>	<b>Other</b>	<b>Total</b>
<b>Personnel:</b>					
(a) Number of FTEs*		12			12.00
(b) Personal Service		872,000			\$ 872,000
(c) Employer Contributions		272,064			\$ 272,064

Program/Case Services					\$ 0
Pass-Through Funds					\$ 0
Other Operating Expenses		55,936			\$ 55,936
<b>Total</b>	\$ 0	\$ 1,200,000	\$ 0	\$ 0	\$ 1,200,000
<i>* If new FTEs are needed, please complete Section G (Detailed Justification for FTEs) below.</i>					

(3) Base Appropriation:

State       \$ 44,909,258  
Federal     \$ 11,215,538  
Other       \$ 7,455,793

(4) Is this priority associated with a Capital Budget Priority?       No       If yes, state Capital Budget Priority Number and Project Name: \_\_\_\_\_.

G. Detailed Justification for FTEs

(4) Justification for New FTEs

- (a) Justification: In past years, Clemson has been able to use existing vacant positions to fill positions associated with new appropriated General funds. New FTEs will be needed to implement the requested initiative  
(b) Future Impact on Operating Expenses or Facility Requirements:

(2) Position Details:

	State	Federal	Earmarked	Restricted	Total
Position Title: Faculty					
(a) Number of FTEs	10				10.00
(b) Personal Service	772,000				772,000
(c) Employer Contributions	240,864				\$ 240,864

	State	Federal	Earmarked	Restricted	Total
Position Title: Technicians					
(a) Number of FTEs	2				2.00
(b) Personal Service	100,000				\$ 100,000

(c) Employer Contributions	31,200				\$ 31,200
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(3) FTEs in Program Area per FY 2007-08 Appropriation Act:

State     \_\_\_494.88\_\_\_  
Federal   \_\_\_147.37\_\_\_  
Other     \_\_\_74.35\_\_\_

Agency-wide Vacant FTEs as of July 31, 2007:   \_\_\_306.62\_\_\_  
% Vacant   \_\_\_7.3\_\_\_%

H. Other Comments:

### III. DETAILED JUSTIFICATION FOR CAPITAL BUDGET PRIORITIES

- A. Agency Section/Code/Name: SECTION 35, P20-Clemson University Public Service Activities
- B. Priority No. \_1\_ of \_5\_
- C. Strategic Goal/Action Plan (*if applicable*): Agrisystems Productivity and Profitability: Both agricultural producers and consumers in South Carolina are demanding sound scientific information on food safety, environmental quality, and animal welfare. These demands can only be met through sound research and education programs. Currently, the facilities to conduct these programs do not exist at Clemson University.
- D. Project Name and Number (*if applicable*): Farm Animal Research Center
- E. Agency Activity Number and Name:  
1510 Sustainable Agricultural Production Systems: Animal Production Systems  
1495 Agriculture Biotechnology  
1491 Reducing the Impact of Animal Agriculture on the Environment

F. Description of Priority: The University will construct new and renovate existing facilities to support the research and education programs in the animal sciences. These facilities will make it possible to conduct programs to address pressing issues facing both animal agriculture producers and consumers. Consumers of today are interested in low cost food products from a system that is free of pathogens, has minimal impact on the environment, and addresses the animal's welfare. Facilities do not currently exist to properly address mandates related to food safety, environmental quality, and animal welfare concerns.

G. Detailed Justification for Funding

(1) Justification for Funding Priority:

The current Clemson animal farms are extended over 4,400 acres in three counties, posing major logistical challenges and requiring duplication of equipment and personnel to handle and care for beef and dairy cattle, poultry and swine.

The existing animal facilities are more than 30 years old and are in need of extensive, ongoing and costly maintenance to ensure continued accreditation by the American Association of Laboratory Animal Care and continued compliance with state and federal biosecurity regulations and with S.C. Department of Health and Environmental Control waste management regulations.

Upgrading and centralizing the animal research facilities will allow Clemson to increase efficiency and to construct state-of-the-art facilities for teaching, research and extension that will meet current and future accreditation standards and will allow modeling for commercial producers. It is difficult to maintain commercial production levels of swine at the current facilities, and commercial production levels of poultry and dairy cattle are not attainable in the existing facilities.

New facilities are also needed to attract top students and faculty in the animal sciences and to conduct cutting edge research that will ensure a strong and enduring future for South Carolina's animal industries. In addition, a centralized farm with commercial grade facilities will position Clemson to participate in new animal research areas such as biomedicine, genetic mapping and the environment

(b) Faculty committees and animal industry producers have identified future research, teaching and extension farm needs in livestock and poultry. The proposed Farm Animal Research Center will provide:

- Centralized, state-of-the-art animal farms that serve as an industry model for operating efficiency and compliance with regulations for biosecurity and waste management
- Commercial grade facilities to support the state's livestock producers with research and workshops and to prepare students as future livestock producers
- Continued accreditation by the American Association of Laboratory Animal Care (AALAC)
- Modern research, teaching and extension space for the 18 Clemson departments currently using animal farms
- Recruitment and retention of outstanding faculty who expect modern research and education facilities
- A learning environment that places students in more realistic commercial livestock and poultry facilities
- A work and study environment conducive to increased competitiveness for funding from federal, state and industry sources

- (c) Both agricultural producers and consumers in South Carolina are demanding sound scientific information on food safety, environmental quality, and animal welfare. These demands can only be met through sound research and education programs. Currently, the facilities to conduct these programs do not exist at Clemson University.
- (d) There are not other known sources of funding to construct these facilities. State, Federal, and private funds will be used to support the research and education programs in these facilities.
- (e) PSA does not have excess operating funds to construct these facilities. Current funds are fully committed to on-going PSA programs.

This project was priority 1 on the PSA 2007 CPIP.

(2)

<b>Total Project Cost Estimates:</b>	<b>Additional State Funds</b>	<b>Previously Authorized State Funds</b>	<b>Total Other Fund Sources</b>	<b>Project Total</b>
Total Project Cost*	13,000,000	3,600,000		\$16,600,000

\* If additional annual operating costs from any source of funding are anticipated upon project completion please complete Sections H and I (Justification for Additional Future Annual Operating Costs) below.

H. Justification for First Year Additional Future Annual Operating Costs:

(1) Will additional annual operating costs be absorbed into your existing budget? \_\_\_ Yes \_\_\_

If not, will additional state funds be needed in the future? \_\_\_\_\_

If state funds will not be needed in the future, explain the source(s) that will be used. \_\_\_\_\_

(2) First Fiscal Year Additional Annual Operating Costs Are Anticipated: \_\_\_\_\_ Will this fiscal year require a partial or full year's operating funds? \_\_\_\_\_ If a partial year's funds are required, what portion of the year does it cover? \_\_\_\_\_

(3)

<b>Additional Annual Operating Cost Details:</b>	<b>State Non-Recurring</b>	<b>State Recurring</b>	<b>Federal</b>	<b>Other</b>	<b>Total</b>
<b>Total Costs:</b>					
(a) Number of FTEs					0.00

(b) Total Personnel Costs					\$ 0
(c) Furniture/Equipment					\$ 0
(d) Other Operating Costs					\$ 0
<b>Total</b>	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

I. Justification for First Full Year Additional Future Annual Operating Costs *(If Section H above represents a full year's operating funds, do not complete this section.)*

- (1) Will additional annual operating costs be absorbed into your existing budget? \_\_\_\_\_  
 If not, will additional state funds be needed in the future? \_\_\_\_\_  
 If state funds will not be needed in the future, explain the source(s) that will be used. \_\_\_\_\_

- (2) First Full Fiscal Year Additional Annual Operating Costs Are Anticipated: \_\_\_\_\_

(3)

<b>Additional Annual Operating Cost Details:</b>	<b>State Non-Recurring</b>	<b>State Recurring</b>	<b>Federal</b>	<b>Other</b>	<b>Total</b>
<b>Total Costs:</b>					
(a) Number of FTEs					0.00
(b) Total Personnel Costs					\$ 0
(c) Furniture/Equipment					\$ 0
(d) Other Operating Costs					\$ 0
<b>Total</b>	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

J. Other Comments:

A. Agency Section/Code/Name: SECTION 35, P20-Clemson University Public Service Activities

B. Priority No. \_\_2\_\_ of \_\_5\_\_

- C. Strategic Goal/Action Plan (*if applicable*): Agrisystems Productivity and Profitability
- D. Project Name and Number (*if applicable*): Cellulosic Bio-Ethanol Pilot Plan
- E. Agency Activity Number and Name: 1495 Agricultural Biotechnology, 1514 Sustainable Agricultural Production Systems: Agronomic Crops
- F. Description of Priority: To develop technology that will support conversion of local feedstocks to bio-ethanol and promote the development of a biofuels industry in South Carolina, Clemson University has formed a research collaborative with the Savannah River National Laboratory, S.C. State University, SC Bio and Queensland University of Technology in Australia. Each partner brings complimentary strengths that allow the alliance to tackle this issue from a holistic approach, feedstock to consumer. As part of this collaborative, Clemson University proposes to build and operate a cellulosic bio-ethanol pilot plant that will facilitate rapid commercialization of new technologies. The pilot plant will bring interdisciplinary, multi-faceted bench scale research from the collaborative partners into a pre-commercialization environment for testing and will facilitate private/public cooperation for commercializing this technology. The proposed pilot plant will help develop a viable and sustainable biofuels industry in South Carolina while promoting advanced interdisciplinary education programs related to the rapidly growing biofuels industries.
- G. Detailed Justification for Funding
- (1) Justification for Funding Priority: Bio-ethanol production is rapidly expanding throughout the United States. It is being driven by concerns about energy security, the environment and the need to stimulate rural and agricultural economic growth. Biofuels are the only alternative fuel that can be incorporated into the existing petroleum based transportation infrastructure. Experts predict that bio-ethanol capacity will peak at 15 billion gallons per year based on the current corn model. To meet the President's goal of nearly 32 billion gallons per year, bio-ethanol produced from cellulosic materials (grasses, tree, crop residues) must become economically viable. South Carolina is a grain deficit state and cannot compete with the corn bio-ethanol model. However, the state's vast cellulosic resources offer a unique opportunity to develop a viable and sustainable bio-ethanol industry. The cellulosic pilot plant will support the rapid commercialization of novel technology for the conversion of cellulosic feedstocks to bio-ethanol, expand the research base within Clemson University and promote the development of cellulosic bio-ethanol production facilities in the state. This pilot plant will:
- Scale-up novel technologies that economically convert locally available cellulosic feedstock to bio-ethanol
  - Facilitate private/public partnership early in development to accelerate commercialization
  - Create a nationally recognized program for biofuels by providing researchers the tools to rapidly scale-up bench scale technology to commercialization



- Lay the foundation for new companies and high-paying jobs for South Carolinians in the biofuels industry
- Increase the value of research through process and product development

This is a new initiative and was not on the 2007 PSA CPIP.

(2)

<b>Total Project Cost Estimates:</b>	<b>Additional State Funds</b>	<b>Previously Authorized State Funds</b>	<b>Total Other Fund Sources</b>	<b>Project Total</b>
Total Project Cost*	12,000,000			\$12,000,000

\* If additional annual operating costs from any source of funding are anticipated upon project completion please complete Sections H and I (Justification for Additional Future Annual Operating Costs) below.

H. Justification for First Year Additional Future Annual Operating Costs:

(1) Will additional annual operating costs be absorbed into your existing budget? \_\_\_Yes\_\_\_

If not, will additional state funds be needed in the future? \_\_\_\_\_

If state funds will not be needed in the future, explain the source(s) that will be used. \_\_\_\_\_

(2) First Fiscal Year Additional Annual Operating Costs Are Anticipated: \_\_\_\_\_ Will this fiscal year require a partial or full year's operating funds? \_\_\_\_\_ If a partial year's funds are required, what portion of the year does it cover? \_\_\_\_\_

(3)

<b>Additional Annual Operating Cost Details:</b>	<b>State Non-Recurring</b>	<b>State Recurring</b>	<b>Federal</b>	<b>Other</b>	<b>Total</b>
<b>Total Costs:</b>					
(a) Number of FTEs					0.00
(b) Total Personnel Costs					\$ 0
(c) Furniture/Equipment					\$ 0
(d) Other Operating Costs					\$ 0
<b>Total</b>	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

I. Justification for First Full Year Additional Future Annual Operating Costs (*If Section H above represents a full year's operating funds, do not complete this section.*)

J. Other Comments

A. Agency Section/Code/Name: SECTION 35, P20-Clemson University Public Service Activities

B. Priority No.   3   of   5  

C. Strategic Goal/Action Plan (*if applicable*): Agrisystems Productivity and Profitability

D. Project Name and Number (*if applicable*): Pilot Scale Bioprocessing Center

E. Agency Activity Number and Name: 1495 Agriculture Biotechnology

F. Description of Priority:

Clemson University proposes to develop a pilot scale biotech manufacturing/bioprocessing facility to support process development, product development, and research for public institutions and private companies. The facility would provide opportunities for degrees and advanced educational opportunities in graduate and PhD programs in biochemistry and bioprocessing manufacturing management. Facilities to address these research and development opportunities do not exist in the State of South Carolina.

G. Detailed Justification for Funding

(1) Justification for Funding Priority: The pilot scale bioprocessing facility will make it possible to increase the image and visibility of South Carolina in the biotechnology industry and expand the research base within Clemson University and other state research institutions. This facility will:

- Develop novel technologies to separate and purify biotech compounds for commercial production
- Create new companies and jobs by developing a critical industry infrastructure mechanism
- Create a nationally recognized program for biotechnology-based manufacturing management majors by blending science and manufacturing education
- Lay the foundation for new companies and high-paying jobs for South Carolinians in the bioprocessing industry

- Increase the value of research through process and product development for South Carolina industries

This project was priority 2 on the PSA 2007 CPIP.

(2)

<b>Total Project Cost Estimates:</b>	<b>Additional State Funds</b>	<b>Previously Authorized State Funds</b>	<b>Total Other Fund Sources</b>	<b>Project Total</b>
Total Project Cost*	32,000,000			\$32,000,000

\* If additional annual operating costs from any source of funding are anticipated upon project completion please complete Sections H and I (Justification for Additional Future Annual Operating Costs) below.

H. Justification for First Year Additional Future Annual Operating Costs:

(1) Will additional annual operating costs be absorbed into your existing budget? \_\_Yes\_\_

If not, will additional state funds be needed in the future? \_\_\_\_\_

If state funds will not be needed in the future, explain the source(s) that will be used. \_\_\_\_\_

(2) First Fiscal Year Additional Annual Operating Costs Are Anticipated: \_\_\_\_\_ Will this fiscal year require a partial or full year's operating funds? \_\_\_\_\_ If a partial year's funds are required, what portion of the year does it cover? \_\_\_\_\_

(3)

<b>Additional Annual Operating Cost Details:</b>	<b>State Non-Recurring</b>	<b>State Recurring</b>	<b>Federal</b>	<b>Other</b>	<b>Total</b>
<b>Total Costs:</b>					
(a) Number of FTEs					0.00
(b) Total Personnel Costs					\$ 0
(c) Furniture/Equipment					\$ 0
(d) Other Operating Costs					\$ 0

<b>Total</b>	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
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I. Justification for First Full Year Additional Future Annual Operating Costs *(If Section H above represents a full year's operating funds, do not complete this section.)*

(2) Will additional annual operating costs be absorbed into your existing budget? \_\_\_\_\_

If not, will additional state funds be needed in the future? \_\_\_\_\_

If state funds will not be needed in the future, explain the source(s) that will be used. \_\_\_\_\_

(2) First Full Fiscal Year Additional Annual Operating Costs Are Anticipated: \_\_\_\_\_

(3)

<b>Additional Annual Operating Cost Details:</b>	<b>State Non-Recurring</b>	<b>State Recurring</b>	<b>Federal</b>	<b>Other</b>	<b>Total</b>
<b>Total Costs:</b>					
(a) Number of FTEs					0.00
(b) Total Personnel Costs					\$ 0
(c) Furniture/Equipment					\$ 0
(d) Other Operating Costs					\$ 0
<b>Total</b>	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

J. Other Comments:

A. Agency Section/Code/Name: SECTION 35, P20-Clemson University Public Service Activities

B. Priority No. \_4\_ of \_5\_

- C. Strategic Goal/Action Plan (*if applicable*): Agrisystems Productivity and Profitability
- D. Project Name and Number (*if applicable*): Expanded BioSafety Level (BSL) III Diagnostic and Research Capability
- E. Agency Activity Number and Name:  
1493 Agriculture Biosecurity  
1504 Livestock Poultry Health Programs: Animal Health and Diagnostic Laboratory
- F. Description of Priority: Addition to the Clemson University Veterinary Diagnostic Center.
- G. Detailed Justification for Funding

(1) Justification for Funding Priority:

Over the past two decades 75% of the emerging infectious diseases have been zoonotic diseases that are animal-based but also can infect people. In fact, animals are the sentinels for human disease. Examples of birds and animals serving as sentinels for human disease include the West Nile Virus, Monkey Pox, and globally the recent outbreak of the Asian strain of Avian Influenza H5N1. The Asian H5N1 Avian Influenza strain from Asia requires biosafety level III facilities for handling and response. This disease has been predicted to arrive in the United States as early as next year.

Since 9-11, new regulations require routine diagnostic virus isolation to be performed under biosafety level III guidelines for disease control purposes and to protect employees working the laboratory. In addition to Avian Influenza, many of the foreign animal diseases -such as Foot & Mouth Disease, Rift Valley Fever, Classical Swine Fever, and African Swine Fever- should be handled under level III conditions. Also, endemic disease agents in South Carolina such as West Nile Virus, Rabies, Eastern Equine Encephalitis, and Brucellosis should be handled in a level III environment.

The Clemson University Veterinary Diagnostic Center was originally designed to extend an addition to the existing biosafety level II laboratory facility. The prospectus for the level III addition to the existing facility has now been completed. This additional facility would provide for the safety and protection of employees working in veterinary diagnostics and research and enhance disease control measures.

Finally, the central location of this facility supports collaborative research with other universities and state agencies. The biosafety level III laboratory would be easily accessible for enhance collaborative research with the S.C. Department of Health and Environmental Control, the S.C. Department of Natural Resources, the Medical University of South Carolina, and the University of South Carolina Arnold School of Public Health. The Clemson University Livestock Poultry Health Division professional staff is highly qualified and poised to participate in such collaborative research projects on zoonotic and food-borne disease that may threaten the health of South Carolina citizens.

The facility will provide state of the art diagnostic and research facilities to meet the challenge of handling new and emerging zoonotic diseases such as Avian Influenza, West Nile Virus, Nipah Virus, Bovine Spongiform Encephalopathy (BSE –Mad Cow), and Monkey Pox.

Due to the ever increasing concerns regarding biosafety, this facility is now a capital priority. It was Priority 5 on the PSA 2007 CPIP.

(2)

<b>Total Project Cost Estimates:</b>	<b>Additional State Funds</b>	<b>Previously Authorized State Funds</b>	<b>Total Other Fund Sources</b>	<b>Project Total</b>
Total Project Cost*	5,000,000			\$5,000,000

*\* If additional annual operating costs from any source of funding are anticipated upon project completion please complete Sections H and I (Justification for Additional Future Annual Operating Costs) below.*

H. Justification for First Year Additional Future Annual Operating Costs:

(1) Will additional annual operating costs be absorbed into your existing budget? \_\_\_Yes\_\_\_

If not, will additional state funds be needed in the future? \_\_\_\_\_

If state funds will not be needed in the future, explain the source(s) that will be used. \_\_\_\_\_

(2) First Fiscal Year Additional Annual Operating Costs Are Anticipated: \_\_\_\_\_ Will this fiscal year require a partial or full year's operating funds? \_\_\_\_\_ If a partial year's funds are required, what portion of the year does it cover? \_\_\_\_\_

(3)

<b>Additional Annual Operating Cost Details:</b>	<b>State Non-Recurring</b>	<b>State Recurring</b>	<b>Federal</b>	<b>Other</b>	<b>Total</b>
<b>Total Costs:</b>					
(a) Number of FTEs					0.00
(b) Total Personnel Costs					\$ 0
(c) Furniture/Equipment					\$ 0
(d) Other Operating Costs					\$ 0

<b>Total</b>	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
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I. Justification for First Full Year Additional Future Annual Operating Costs *(If Section H above represents a full year's operating funds, do not complete this section.)*

(3) Will additional annual operating costs be absorbed into your existing budget? \_\_\_\_\_

If not, will additional state funds be needed in the future? \_\_\_\_\_

If state funds will not be needed in the future, explain the source(s) that will be used. \_\_\_\_\_

(2) First Full Fiscal Year Additional Annual Operating Costs Are Anticipated: \_\_\_\_\_

(3)

<b>Additional Annual Operating Cost Details:</b>	<b>State Non-Recurring</b>	<b>State Recurring</b>	<b>Federal</b>	<b>Other</b>	<b>Total</b>
<b>Total Costs:</b>					
(a) Number of FTEs					0.00
(b) Total Personnel Costs					\$ 0
(c) Furniture/Equipment					\$ 0
(d) Other Operating Costs					\$ 0
<b>Total</b>	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

J. Other Comments:

A. Agency Section/Code/Name: SECTION 35, P20-Clemson University Public Service Activities

B. Priority No. \_\_5\_ of \_5\_\_

C. Strategic Goal/Action Plan *(if applicable)*: Agrisystems Productivity and Profitability

D. Project Name and Number (*if applicable*): Advanced Plant Technology Laboratory

E. Agency Activity Number and Name: 1496 Agricultural Biotechnology

F. Description of Priority: Clemson University's advanced plant technology program will provide critical research needed for a successful agriculture-based biotechnology industry in South Carolina. Its mission is to improve yield and quality of traditional crops, produce protein-based products in genetically modified plants and improve crops for biofuel feedstock. The program, based at the Pee Dee Research & Education Center in Florence, provides the basic scientific platform to effectively focus Clemson's agriculture research and education programs on South Carolina's emerging plant-based technology needs. An integrated team of plant breeders, biochemists, molecular geneticists, mechanical engineers and agronomists will provide the agribusiness community with opportunities for the production of higher value traditional crops, newly developed plant-made proteins, and biofuel crops developed specifically for South Carolina's soils and climate. The team will work collaboratively with industry and in collaboration with ongoing biotechnology research on Clemson University's main campus that spans a diverse technology base including textiles, chemicals, agriculture, forestry and foods. Graduate education programs in advanced plant technology will provide the agribusiness community with the next generation of scientists to advance the production of food, fuel and fiber.

G. Detailed Justification for Funding

(1) Justification for Funding Priority: Developing crops with improved value, or for new purposes such as biofuel, requires the integrated research efforts of a team of scientists, modern laboratory facilities and controlled test environments. The Pee Dee Research & Education Center has a dedicated research team, secure testing sites with soils and climate representative of the major crop production areas of the state, and basic laboratories that serve most traditional agricultural research needs. The advanced plant technology laboratory will equip the research team with modern, well-equipped laboratories that meet the demands of biotechnology research and graduate education. The laboratory will bridge traditional agricultural production research and advanced biotechnology and create a vital linkage to agribusiness partners for the development of new and improved crops. The Advanced Plant Technology Laboratory complements excellent test facilities, offices and conference facilities at the Pee Dee Research & Education Center and specifically will:

- Provide for the development of improved crops for biofuels to serve as feedstock for the ethanol and biodiesel industries
- Provide for the development of improved traditional crops such as stronger fiber, drought resistance, insect and disease resistance, and improved yield quality and quantity
- Provide for the development of transformation, extraction and purification technologies for plant-made products
- Provide graduate education opportunities in the field of plant biotechnology to serve the state's agribusiness industry

This is a new initiative and was not on the 2007 PSA CPIP



(2)

<b>Total Project Cost Estimates:</b>	<b>Additional State Funds</b>	<b>Previously Authorized State Funds</b>	<b>Total Other Fund Sources</b>	<b>Project Total</b>
Total Project Cost*	7,000,000			\$7,000,000

\* If additional annual operating costs from any source of funding are anticipated upon project completion please complete Sections H and I (Justification for Additional Future Annual Operating Costs) below.

H. Justification for First Year Additional Future Annual Operating Costs:

(1) Will additional annual operating costs be absorbed into your existing budget? \_\_\_Yes\_\_\_

If not, will additional state funds be needed in the future? \_\_\_\_\_

If state funds will not be needed in the future, explain the source(s) that will be used. \_\_\_\_\_

(2) First Fiscal Year Additional Annual Operating Costs Are Anticipated: \_\_\_\_\_ Will this fiscal year require a partial or full year's operating funds? \_\_\_\_\_ If a partial year's funds are required, what portion of the year does it cover? \_\_\_\_\_

(3)

<b>Additional Annual Operating Cost Details:</b>	<b>State Non-Recurring</b>	<b>State Recurring</b>	<b>Federal</b>	<b>Other</b>	<b>Total</b>
<b>Total Costs:</b>					
(a) Number of FTEs					0.00
(b) Total Personnel Costs					\$ 0
(c) Furniture/Equipment					\$ 0
(d) Other Operating Costs					\$ 0
<b>Total</b>	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

I. Justification for First Full Year Additional Future Annual Operating Costs (If Section H above represents a full year's operating funds, do not complete this section.)

## J. Other Comments

## FY 2008-09 COST SAVINGS & ACTIVITY PRIORITY ADDENDUM

## I. PRIORITY ASSESSMENT OF ACTIVITIES – HIGHEST PRIORITIES

A. Agency Section/Code/Name: SECTION 35, P20-Clemson University Public Service Activities

B. See attached transmittal letter.

[illegible]

## FY 2008-09 ACTIVITY PRIORITY ADDENDUM

### II. PRIORITY ASSESSMENT OF ACTIVITIES – **LOWEST PRIORITIES**

A. Agency Section/Code/Name: **SECTION 35, P20-Clemson University Public Service Activities**

B. Agency Activity Number and Name:

C. Explanation of Lowest Priority Status: See attached transmittal letter.

D. Estimate of Savings:

Estimate of Savings:	General	Federal	Supplemental	Capital Reserve	Other	Total
<b>Personnel:</b>						
(a) Number of FTEs	0	0	0	0	0	0.00
(b) Personal Service	0		0	0	0	\$ 0
(c) Employer Contributions	0		0	0	0	\$ 0
Program/Case Services	0	0	0	0	0	\$ 0
Pass-Through Funds	0	0	0	0	0	\$ 0
Other Operating Expenses	0	0	0	0	0	\$ 0
<b>Total</b>	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0

E. Activity Impact (*Describe the impact on the activity affected including the impact on customers and clients.*):

F.

[illegible]